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CLINICAL SCIENCE

PERCEPTION OF DIFFICULTIES WITH VISION-RELATED ACTIVITIES OF DAILY LIVING AMONG PATIENTS UNDERGOING UNILATERAL POSTERIOR CAPSULOTOMY

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OBJECTIVES: To assess the influence of Nd:YAG (neodymium: yttrium-aluminum- garnet) laser unilateral posterior capsulotomy on visual acuity and patients' perception of difficulties with vision-related activities of daily life.
METHODS: We conducted an interventional survey that included 48 patients between 40 and 80 years of age with uni- or bilateral pseudophakia, posterior capsule opacification, and visual acuity ≤0.30 (logMAR) in one eye who were seen at a Brazilian university hospital. All patients underwent posterior capsulotomy using an Nd:YAG laser. Before and after the intervention, patients were asked to complete a questionnaire that was developed in an exploratory study.
RESULTS: Before posterior capsulotomy, the median visual acuity (logMAR) of the included patients was 0.52 (range 0.30-1.60). After posterior capsulotomy, the median visual acuity of the included patients improved to 0.10 (range 0.0-0.52). According to the subjects' perceptions, their ability to perform most of their daily life activities improved after the intervention ($p<0.05$).
CONCLUSIONS: After patients underwent posterior capsulotomy with an Nd:YAG laser, a significant improvement in the visual acuity of the treated eye was observed. Additionally, subjects felt that they experienced less difficulty performing most of their vision-dependent activities of daily living.

KEYWORDS: Posterior capsule opacification; Capsulotomy; Nd:YAG lasers; Patients' perception; Daily activities.

INTRODUCTION

Posterior capsule opacification is the most common long-term complication that occurs after extracapsular extraction. It is also referred to as a secondary cataract, capsular fibrosis, or epithelial pearls.[1,2] It usually leads to a decrease in visual acuity due to a direct blockade of the visual axis, at times also leading to a deterioration of contrast sensitivity, glare disability, and monocular diplopia.[3]

Clinical studies have shown different incidence rates of posterior capsule opacification, some of which reach almost 50%.[1,3] There is an age-related trend concerning opacification; in general, older patients have a lower incidence of posterior capsule opacification.[4] In an ophthalmological follow-up exam that was performed 26 months after surgery, Senne *et al*.[5] found that posterior capsule opacification was the second cause of visual acuity ≤20/100 (17% of 62 eyes) . In another follow-up study performed 43 months after surgery, the same authors found that posterior capsule opacification was the first cause of visual acuity ≤20/100 (50% of 42 eyes).

Since the 1980s, neodymium: yttrium-aluminum-garnet (Nd:YAG) lasers have been the most widely used therapeutic modality for treatment of posterior capsule opacification and have largely replaced invasive surgery.[6,7] From the clinical standpoint, the visual symptoms of secondary cataract may vary greatly in terms of the degree of posterior capsule opacification.[1]

The primary visual test that is used to assess patients with cataract and posterior capsule opacification is visual acuity, which has been historically used to measure both

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visual function and visual deficiency.[8]

Ocular diseases have a substantial impact on patients' quality of life because visual loss affects multiple aspects of functionality.[9] A series of tools has been developed to assess health-related quality of life. Despite the large amount of literature on the subject, no unified approach to evaluating patients' quality of life has been established, and there is little consensus on its relevance.[10] These instruments only apply to patients from the cultural background in which they were developed, and whenever there is a need to use them in other populations, translation, adaptation, and validation are required.[11,12]

The adaptation of questionnaires that have been used for patients with visual disturbances allows us not only to explore specific aspects of visual deficiency but also to compare the risk-benefit ratios of different therapies.[11] The administration of these questionnaires via interviews seems to be the best approach in some countries, especially because the low education level of the assessed population limits the use of self-administered questionnaires.

The present study was conducted on a sample of patients with unilateral posterior capsule opacification who were seen at a Brazilian university hospital. Our goal was to assess the influence of Nd:YAG laser posterior capsulotomy on patients' visual acuity and their perception of the difficulties they experienced with vision-related activities of daily life.

METHODS AND MATERIALS

The study was designed as an interventional cross-sectional survey. A readily accessible sample of patients was selected from all of the patients who were scheduled for consultation at the Outpatient Ophthalmology Unit (YAG Laser Service, *Faculdade de Medicina da Universidade Federal do Triângulo Mineiro* in Uberaba, Brazil) between September 2004 and March 2006. The study was performed in accordance with the tenets of the Declaration of Helsinki.

To be included in the study, patients had to meet the following criteria: (1) be between 40 and 80 years of age; (2) have uni- or bilateral pseudophakia with an intraocular posterior chamber lens implant that was placed without previous surgical complications; (3) have unilateral posterior capsule opacification and corrected visual acuity in the affected eye of ≤0.30 (logMAR); and (5) be capable of providing consent to answer the questionnaire.

The survey excluded the following: (1) patients suffering from ocular disorders other than cataracts; (2) patients with a history of amblyopia and strabismus; and (3) patients with mobility, hearing, and/or speech impairment(s).

The questionnaire was developed based on the results of an exploratory study, which was conducted according to the methodological procedures proposed by Piovesan and Temporini.[13] Based on open-ended questions that were asked during individual interviews to a population that had similar characteristics to the subjects in this study, closed-ended questions concerning vision-related daily activities were developed. The patients were asked if they had difficulties carrying out a certain activity due to their visual impairment even if they wore glasses. Visual function subscales were used with various activities chosen as references for the following types of vision: (1) near vision (e.g., needle and thread chores, picking rice/beans, washing vegetables/fruits, shaving, reading price tags, reading books/newspaper/magazines/the Bible, driving nails/repairing things at home/stripping wire); (2) mid-range vision (e.g., walking up and down stairs, picking out clothes to wear, washing dishes/clothes, ironing, bathing, cooking, or combing hair); (3) distance vision (e.g., walking down the street, crossing the street, recognizing people from across the street, watching television, reading the name or number on a nearby bus, or reading street signs); and (4) depth perception (e.g., pouring water into a glass). The questionnaire was tested prior to use in this study in a sample of eight patients who had characteristics that were similar to those of the study sample.

Patients underwent their scheduled ophthalmological examination and answered the questions on the questionnaire before and up to three months after secondary unilateral capsulotomy with an Nd:YAG laser (YC 1200, NIDEK, Gamagori, Japan). We used the technique of shooting the laser through a Peyman lens to perform the capsulotomy. This process was continued until an opening slightly larger than the pupil (as previously evaluated under dynamic conditions) was obtained.

For analysis of visual acuity data, the logarithm of the reciprocal to the Snellen fraction with extended scale was used, which is equivalent to the logarithm of the minimal angle of resolution (logMAR). We assumed that "finger count" is equivalent to 0.025, whose logMAR is equal to 1.6.[14]

The results of the visual acuity analysis were also converted into percentages of loss of central vision. Because an eye with good vision can compensate for a contralateral eye with worse vision, we calculated the percentage of visual impairment (PVI) as described by Applegate et al.[15], who created the following standardized disability formula used by the American Medical Association that assigns a greater weight for the eye with better visual acuity: ([three times the better eye's percent disability] plus [the worse eye's percent disability]) divided by four.

Stereoacuity was measured before and after capsulotomy by the Titmus Stereo Fly, Circles, and Animals Test (Stereo Optical Co., Inc., Chicago, IL), which was shown at a distance of 40 centimeters.

For statistical analysis, we used the Wilcoxon matched pairs test to compare data obtained before and after capsulotomy. A value of $p<0.05$ was considered statistically significant. The data obtained from the questionnaire were also statistically analyzed. We reduced the values of a distribution to one single value, called the mean scale value (MSV).[16] Each answer was assigned a certain number of points, such that a lower score meant worse impairment/more influence of visual impairment on the subject's quality of life. A score of 0 corresponded to "does not do", a score of 1 corresponded to "very difficult", a score of 2 corresponded to "some difficulty", and a score of 3 corresponded to "no difficulty".

RESULTS

The sample included 20 male (42%) and 28 female (58%) subjects. The mean age of the patients was 68 years, and the median was 70 years. Prior to the laser procedure, a total of 27 patients (Group 1) had visual acuity of >0.30 (logMAR) in the unaffected eye. These patients had a median age of 68 years. The other 21 patients (Group 2) had visual acuity of ≤0.30 (logMAR) in the unaffected eye and a median age of 73 years.

The visual acuity of the capsulotomized eye was measured before and after the Nd:YAG laser procedure, and the changes in those values are summarized in Table 1. There was significant improvement in the visual acuity of the capsulotomized eye ($p<0.01$). The median visual acuity of the contralateral eye of each patient, which was measured prior to capsulotomy, was 0.22 (range 0.0 to 1.00).

Table 1 also summarizes the change in the percentage of visual impairment and stereoacuity that patients experienced before and after the Nd:YAG laser procedure. There was a significant decrease in PVI and a significant improvement in stereoacuity following capsulotomy ($p<0.01$).

Activities related to near vision [e.g., (1) needle and thread chores (for women), (2) shaving (for men), (3) driving nails/repairing things at home/stripping wire, (4) reading books/newspapers/magazines/the Bible, (5) picking rice/beans, (6) washing vegetables/fruits, and (7) reading price tags] were described as very or moderately difficult by 86% of the women (MSV = 1.5, category 1) and 40% of the men (MSV = 2.5, category 2), and by 41% (MSV = 2.2, category 3), 63% (MSV = 1.6, category 4), 42% (MSV = 2.1, category 5), 35% (MSV = 2.3, category 6), and 64% (MSV = 1.9, category 7) of all subjects (i.e., Group 1 + Group 2). Almost all of these parameters changed after posterior capsulotomy, except for those related to shaving (Group 2) (Table 2).

Concerning activities related to mid-range vision, the following activities were perceived as moderately or very difficult by the following percentages of included subjects [i.e., (Group 1 + Group 2)]: (1) washing dishes/clothes (31%, MSV = 2.3); (2) ironing (18%, MSV = 1.8); (3) walking up and down stairs (51%, MSV = 2.1); (4) picking out clothes to wear (24%, MSV = 2.6); (5) bathing without help (2%, MSV = 3.0); (6) cooking (34%, MSV = 2.3); and (7) hair combing (10%, MSV = 2.9). After the Nd:YAG laser procedure, patients' perceived ability of difficulty with performing these tasks changed, except for tasks related to ironing, bathing without help, and hair combing (both groups) as well as picking out clothes to wear and cooking (Group 2) (Table 3).

The differences concerning patients' difficulty in performing activities related to distance vision before and

Table 1 - Visual acuity (VA), percentage of vision impairment (PVI), and stereoacuity before and after capsulotomy.

	Before Capsulotomy		After Capsulotomy	
	Median	Range	Median	Range
VA (logMAR*)	0.52	0.30 – 1.60	0.10	0 – 0.52
Group 1	0.52	0.30 – 1.60	0.10	0 – 0.52
Group 2	0.52	0.40 – 1.60	0.15	0 – 0.52
PVI (%)	20.00	3.75 – 57.50	6.25	0 – 27.50
Group 1	12.50	3,75 – 27.50	2.50	0 – 16.25
Group 2	27.50	16.25 – 57.50	10.00	0 – 27.50
Stereoacuity (")	400	40 - 3000	70	40 – 800
Group 1	400	40 - 3000	50	40 – 400
Group 2	400	50 - 3000	100	40 – 800

Wilcoxon test: $p<0.01$. * logMAR = logarithm of the minimal angle of resolution. " = seconds of arc

Table 2 - Subjects' perceptions of difficulties with activities related to near vision before and after capsulotomy.

Difficulty	Group 1				Group 2			
	Before		After		Before		After	
	n	%	n	%	n	%	N	%
	Total n = 15				Total n = 13			
Needle and thread chores: sewing, embroidery, tricot, crocheting (for women)								
(0) Does not do it								
(1) It is very difficult	-	-	-	-	-	-	-	-
(2) It is moderately difficult	7	15	2	4	10	21	3	6
(3) It is not difficult	6	13	3	6	1	2	3	6
	2	4	10	21	2	4	7	15
	p = 0.0150**				p = 0.0117			
MSV (G1 + G2)*: before = 1.5; after = 2.4								
	Total n = 12				Total n = 8			
Shaving (for men)								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	2	4	-	-	1	2	-	-
(2) It is moderately difficult	4	8	1	2	1	2	-	-
(3) It is not difficult	6	13	11	23	6	13	8	17
	p = 0.0278				NS***			
MSV (G1 + G2): before = 2.5; after = 3.0								
	Total n = 27				Total n = 21			
Driving nails/repairing things at home/stripping wire								
(0) Does not do it	2	4	2	4	1	2	-	-
(1) It is very difficult	4	8	1	2	5	10	1	2
(2) It is moderately difficult	7	15	1	2	4	8	1	2
(3) It is not difficult	14	29	23	48	11	23	19	40
	p = 0.0144				p = 0.0117			
MSV (G1 + G2): before = 2.2; after = 2.8								
	Total n = 27				Total n = 21			
Reading books/newspapers/magazines/the Bible								
(0) Does not do it	1	2	1	2	6	13	4	8
(1) It is very difficult	8	17	-	-	8	17	2	4
(2) It is moderately difficult	9	19	5	10	5	10	6	13
(3) It is not difficult	9	19	21	44	2	4	9	19
	p = 0.0016				p = 0.0051			
MSV (G1 + G2): before = 1.6; after = 2.4								
	Total n = 27				Total n = 21			
Picking rice/beans								
(0) Does not do it	2	4	2	4	3	6	2	4
(1) It is very difficult	6	13	1	2	3	6	1	2
(2) It is moderately difficult	5	10	1	2	6	13	3	6
(3) It is not difficult	14	29	23	48	9	19	15	31
	p = 0.0077				p = 0.0277			
MSV (G1 + G2): before = 2.1; after = 2.6								
	Total n = 27				Total n = 21			
Washing vegetables/fruits								
(0) Does not do it	1	2	1	2	2	4	2	4
(1) It is very difficult	7	15	1	2	3	6	1	2
(2) It is moderately difficult	2	4	1	2	5	10	1	2
(3) It is not difficult	17	35	24	50	11	23	17	35
	p = 0.0117				p = 0.0277			
MSV (G1 + G2): before = 2.3; after = 2.7								
	Total n = 27				Total n = 21			
Reading price tags								
(0) Does not do it	-	-	-	-	2	4	2	4
(1) It is very difficult	7	15	2	4	10	21	-	-
(2) It is moderately difficult	7	15	2	4	6	13	5	10
(3) It is not difficult	13	27	23	48	3	6	14	29
	p = 0.0051				p = 0.0010			
MSV (G1 + G2): before = 1.9; after = 2.6								

* MSV (G1 + G2) = Mean Scale Value (Group 1 + Group 2) (scale limits: 0 and 3); ** Wilcoxon test; *** NS = not significant

Table 3 - Subjects' perceptions of difficulties with activities related to mid-range vision before and after capsulotomy.

Difficulty	Group 1				Group 2			
	Before		After		Before		After	
	n	%	N	%	n	%	n	%
	Total n = 27				Total n = 21			
Washing dishes/clothes								
(0) Does not do it	4	8	3	6	2	4	1	2
(1) It is very difficult	2	4	-	-	1	2	-	-
(2) It is moderately difficult	5	10	1	2	7	15	2	4
(3) It is not difficult	16	33	23	48	11	23	18	38
	p = 0.0180**				p = 0.0284			
MSV (G1 + G2)*: before = 2.3; after = 2.7								
	Total n = 27				Total n = 21			
Ironing								
(0) Does not do it	8	17	6	13	7	15	6	13
(1) It is very difficult	1	2	-	-	3	6	-	-
(2) It is moderately difficult	3	6	3	6	2	4	2	4
(3) It is not difficult	15	31	18	38	9	19	13	27
	p = 0.0679				p = 0.0679			
MSV (G1 + G2): before = 1.8; after = 2.1								
	Total n = 27				Total n = 21			
Walking up and down stairs								
(0) Does not do it	-	-	-	-	1	2	-	-
(1) It is very difficult	7	15	1	2	7	15	3	6
(2) It is moderately difficult	6	13	2	4	4	8	4	8
(3) It is not difficult	14	29	24	50	9	19	14	29
	p = 0.0063				p = 0.0499			
MSV (G1 + G2): before = 2.1; after = 2.7								
	Total n = 27				Total n = 21			
Picking out clothes to wear								
(0) Does not do it	-	-	-	-	1	2	1	2
(1) It is very difficult	3	6	1	2	-	-	-	-
(2) It is moderately difficult	5	10	-	-	4	8	1	2
(3) It is not difficult	19	40	26	54	16	33	19	40
	p = 0.0180				p = 0.1088			
MSV (G1 + G 2): before = 2.6; after = 2.9								
	Total n = 27				Total n = 21			
Bathing without help								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	-	-	-	-	-	-	-	-
(2) It is moderately difficult	-	-	-	-	1	2	-	-
(3) It is not difficult	27	56	27	56	20	42	21	44
	NS***				NS			
MSV (G1 + G2): before = 3.0; after = 3.0								
	Total n = 27				Total n = 21			
Cooking								
(0) Does not do it	2	4	2	4	3	6	3	6
(1) It is very difficult	4	8	-	-	-	-	1	2
(2) It is moderately difficult	6	13	1	2	6	13	1	2
(3) It is not difficult	15	31	24	50	12	25	16	33
	p = 0.0077				p = 0.2249			
MSV (G1 + G2): before = 2.3; after = 2.6								
	Total n = 27				Total n = 21			
Hair combing								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	-	-	-	-	1	2	-	-
(2) It is moderately difficult	3	6	-	-	1	2	2	4
(3) It is not difficult	24	50	27	56	19	40	19	40
	p = 0.1088				NS			
MSV (G1 + G2): before = 2.9; after = 3.0								

* MSV (G1 + G2) = Mean Scale Value (Group 1 + Group 2) (scale limits: 0 and 3); ** Wilcoxon test; *** NS = not significant

after posterior capsulotomy were the most significant. For example, watching television was rated as very or moderately difficult by 53% (MSV = 2.3) of the subjects before capsulotomy and by only 14% (MSV = 2.8) of the subjects after the procedure (Group 1 + Group 2) ($p<0.01$). Reading the name or number on a nearby bus was rated as very or moderately difficult for 68% (MSV = 1.6) of the subjects before capsulotomy and by only 22% (MSV = 2.4) of the subjects after capsulotomy (Group 1 + Group 2) ($p<0.005$) (Table 4).

Table 4 - Perception of difficulties with activities related to distance vision before and after capsulotomy.

Difficulty	Group 1				Group 2			
	Before		After		Before		After	
	N	%	N	%	n	%	n	%
	Total n = 27				Total n = 21			
Watching television								
(0) Does not do it	1	2	-	-	-	-	-	-
(1) It is very difficult	2	4	-	-	6	13	1	2
(2) It is moderately difficult	10	21	4	8	7	15	2	4
(3) It is not difficult	14	29	23	48	8	17	18	38
	p = 0.0086**				p = 0.0033			
MSV (G1 + G2)*: before = 2.3; after = 2.8								
	Total n = 27				Total n = 21			
Reading the name or number on a nearby bus								
(0) Does not do it	3	6	2	4	3	6	3	6
(1) It is very difficult	8	17	1	2	8	17	2	4
(2) It is moderately difficult	9	19	5	10	7	15	3	6
(3) It is not difficult	7	15	19	40	3	6	13	27
	p = 0.0007				p = 0.0022			
MSV (G1 + G2): before = 1.6; after = 2.4								
	Total n = 27				Total n = 21			
Reading street signs								
(0) Does not do it	2	4	1	2	2	4	3	6
(1) It is very difficult	7	15	1	2	8	17	1	2
(2) It is moderately difficult	12	25	3	6	6	13	3	6
(3) It is not difficult	6	13	22	46	5	10	14	29
	p = 0.0004				p = 0.0068			
MSV (G1 + G 2): before = 1.8; after = 2.5								
	Total n = 27				Total n = 21			
Recognizing people from across the street								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	10	21	3	6	11	23	2	4
(2) It is moderately difficult	6	13	4	8	6	13	2	4
(3) It is not difficult	11	23	20	42	4	8	17	35
	p = 0.0071				p = 0.0014			
MSV (G1 + G2): before = 1.9; after = 2.7								
	Total n = 27				Total n = 21			
Walking down the street								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	9	19	-	-	4	8	-	-
(2) It is moderately difficult	8	17	5	10	5	10	6	13
(3) It is not difficult	10	21	22	46	12	25	15	31
	p = 0.0003				p = 0.0382			
MSV (G1 + G2): before = 2.2; after = 2.8								
	Total n = 27				Total n = 21			
Crossing the street								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	8	17	-	-	8	17	-	-
(2) It is moderately difficult	6	13	1	2	3	6	4	8
(3) It is not difficult	13	27	26	54	10	21	17	35
	p = 0.0010				p = 0.0060			
MSV (G1 + G 2): before = 2.1; after = 2.9								

* MSV (G1 + G2) = Mean Scale Value (Group 1 + Group 2) (scale limits: 0 and 3); ** Wilcoxon test

Table 5 - Subjects' perception of difficulties with activities related to depth perception before and after capsulotomy.

Difficulty	Group 1				Group 2			
	Before		After		Before		After	
	N	%	n	%	n	%	n	%
	Total n = 27							
Pouring water into a glass								
(0) Does not do it	-	-	-	-	-	-	-	-
(1) It is very difficult	3	6	1	2	1	2	1	2
(2) It is moderately difficult	6	13	1	2	3	6	1	2
(3) It is not difficult	18	38	25	52	17	35	19	40
	p = 0.0469**				0.3613			
MSV (G1 + G2)*: before = 2.6; after = 2.9								

* MSV (G1 + G2) = Mean Scale Value (Group 1 + Group 2) (scale limits: 0 and 3); ** Wilcoxon test

Pouring water in a glass, an activity related to depth perception, was rated as very or moderately difficult (Group 1 + Group 2) by 27% (MSV = 2.6) of the subjects before and by only 8% (MSV = 2.9) of the subjects after the Nd:YAG laser procedure (Table 5).

The average level of laser energy used was 131.9 mJ. Four patients had ocular hypertension after posterior capsulotomy, one patient presented tiny cracks in the intraocular lens, and one patient had hernia of the vitreous body into the anterior chamber of the eye without displacement of the intraocular lens.

All of the subjects who were interviewed stated that the posterior capsulotomy procedure had been "worthwhile", and 83% stated that they had no further visual difficulties after the procedure.

DISCUSSION

Posterior capsulotomy with an Nd:YAG laser is one of the most frequently performed ophthalmological procedures in the United States. It should be considered to be an important public healthcare issue because of the frequency with which it is performed and because it may be associated with occasional morbidity.[17]

Visual disability has the potential to affect several areas that are related to quality of life.[9] With aging, a gradual deterioration of social, psychological, and physical (including visual) functioning occurs. The decline in visual function itself has been associated with physical and mental decline, and there is growing recognition of the importance of patient-reported visual results because objective measurements may fail to reflect the degree of deterioration that patients experience in their daily activities.[18]

Instruments used to assess quality of life are important and have been widely accepted as resources that can be used to evaluate potential healthcare interventions. In the field of ophthalmology, an emphasis has been placed on determining the functional improvement that patients submitted to cataract surgery experience through the use of tools that are used to assess patients' quality of life and visual function. Such studies have been performed mostly in the United States and in Europe, where several such instruments have been developed and tested.[14,19,20] In Brazil, studies have been conducted about the influence that a second cataract surgery has on patients' visual function and their perception of the influence of the cataract and the surgery on their quality of life.[21]

Improving visual acuity is the primary endpoint by which success is measured for Nd:YAG laser capsulotomy in the treatment of posterior capsule opacification.[22] There is little information available in the literature regarding the visual function parameters and daily life activities that may be improved by laser treatment. As with any surgical procedure, the decision to perform a posterior capsulotomy with the YAG laser should be based on the potential risk-benefit ratio for the individual patient.[23]

The present study sought to identify the influence that unilateral Nd:YAG laser posterior capsulotomy had on visual acuity and on patients' perceptions of difficulties they experienced carrying out their activities of daily living. The mean age of the patients in our study was 68 years (range 40 to 80 years), which is similar to the mean age of 70 years that was reported by Sundelin *et al*.[24] Although the age ranges for cataract surgery and posterior capsule opacification development differ between countries and cultures, these data are compatible with the nature of procedure studied, i.e., Nd:YAG laser posterior capsulotomy after cataract surgery.

Most patients who were interviewed were retired and no longer participating in professional activities at the time of the study. Thus, the impact of the procedure was assessed by analyzing subjects' perceptions of the difficulties they experienced performing vision-related activities of daily living.

There was significant improvement in visual acuity in the capsulotomized eye after the laser treatment, indicating

that this procedure had a beneficial impact on visual acuity, which is in agreement with previous reports.[25] The median percentage of visual impairment of the subjects decreased significantly from 20 to 6.25%, thereby also confirming the positive effect that laser capsulotomy has on binocular vision.

After the procedure, the median stereoacuity of the included subjects showed significant improvement (Table 3). A total of 68.8% of the subjects achieved stereoacuity equal to or better than 100 arc seconds, which has been stated by Kwapiszeski *et al*.[26] as refined stereoscopic vision. The unilateral posterior capsule opacification in this study was associated with reduced stereopsis, causing symptoms related to difficulties judging distances. A secondary posterior capsulotomy can restore normal stereoacuity and reduce the functional limitations that these patients experience. This beneficial result of posterior capsulotomy was observed in this study.

The subjects reported difficulties performing activities that were dependent on near and distance visual function. After capsulotomy, there was a clear perception among patients that they had less difficulty performing most of their daily activities ($p<0.05$), suggesting an improvement in their quality of life that was possibly related to their improved visual acuity, as well as to improvements in peripheral vision and/or stereopsis. Sundelin *et al*.[24] also reported a reduction in patients' perceived difficulties performing activities of daily living following posterior capsulotomy. Their study included patients who had visual acuity ≥ 0.25 in the eye that was affected by posterior capsule opacification, but they also included patients with other ocular diseases. They used the CatQuest questionnaire, which was developed by Lundström *et al*.[27] to test visual disabilities in patients with cataracts.

With regard to mid-range vision, of the seven activities assessed, there was no significant change after capsulotomy for five of the activities that were queried in the study: ironing, bathing without help, and combing of hair (both groups); picking out clothes to wear, and cooking (Group 2). It is possible that the activities "combing of hair" and "bathing without help" are considered very private and are therefore linked to self-esteem. About one third of the patients interviewed before the procedure (32%; MSV = 1.8), and one fourth of the ones interviewed after capsulotomy (24%; MSV = 2.1) stated "does not do it" for "ironing". Perhaps the reply "does not do it" reflects the cultural belief that this activity is a feminine one rather than an activity that a patient does not do because they have visual impairment, a finding that was not detected previously in our exploratory study. There were no significant changes observed in subjects' perceptions of the vision-related difficulties they experienced related to the tasks of picking out clothes to wear and cooking, which may be explained by the higher median age of patients in Group 2 and the lower visual acuity of the contralateral eye in that group. Furthermore, no subject reported that they had a lot of difficulty picking out clothes to wear before or after capsulotomy. Additionally, several patients said that they did not cook. The small sample size of our study may explain the lack of change in the perceptions of patients in Group 2 regarding vision-related difficulties with shaving. As for the only task directly related to depth vision (pouring water into a glass), there was no perception of improvement among patients in Group 2 who showed lesser change in the degree of stereopsis after surgery. Other studies have reported similar problems with depth perception among subjects with monocular vision.[28] In such patients, even activities that are not obviously related to binocular vision, such as watching television, may be affected, due to the phenomenon of suppression or binocular rivalry, which could make binocular vision worse than monocular vision in the eye with the better visual acuity.The four patients in this study who had ocular hypertension after posterior capsulotomy were controlled with antihypertensive drugs and ultimately recovered a normal level of intraocular pressure. The subject who had cracks in the intraocular lens and the one who presented hernia of the vitreous body into the anterior chamber of the eye were satisfied with the final visual acuity that they achieved (0.05 and 0.00, respectively). These complications have been cited in earlier studies and are compatible with the results of this research.[1,23,25]

Studies conducted in patients with cataracts have shown that common activities of daily living have different degrees of importance to patients and that some activities that are only seldom carried out are very important to certain individuals, based on their personal preferences. This finding suggests that a questionnaire that includes the most frequent activities that most individuals perform and is complemented with open-ended questions regarding personal issues of special interest to individual patients as well as their hobbies would be quite useful in this field of research.[29] When adapting this questionnaire to patients with cataracts in Brazil, the authors experienced similar problems after the exploratory study and decided to replace some questions concerning difficulties that patients might experience while performing their activities of daily living, resulting in a more appropriate instrument for the local conditions.[30] Translation and cultural adaptation of such questionnaires are recommended, but we should emphasize that even after this process is accomplished, the final version must be shown to have the same psychometric properties as the original instrument.

Although the inclusion criterion was based on the visual acuity in the capsulotomized eye and although it is well

known that an eye with good vision can compensate for a contralateral eye with weaker vision, the results obtained in this study allow us to state that, from the subjects' point of view, the Nd:YAG laser unilateral posterior capsulotomy improved several aspects of their quality of life. The benefits might have been even greater if the median visual acuity of the fellow eye (logMAR = 0.22) had been better because of the binocular vision improvement. For elderly people, quality of life is believed to be more important than a prolonged lifetime,[21] thereby justifying the growing interest in assessing therapies from the subjective as well as the objective point of view. It is important to note that in this study, most of the patients who underwent the laser capsulotomy reported that they had no visual impairment after the procedure and all patients stated that they were satisfied with it.

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